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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,480	12/30/2003	Robert F. Mortan	TI-36812 (032350.B572)	8732
23494	7590	03/01/2006	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			HOANG, QUOC DINH	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 03/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/748,480

Applicant(s)

MORTAN, ROBERT F.

Examiner

Quoc D. Hoang

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10,12-14,16,17,21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10,13,14,16,17,21 and 22 is/are rejected.
- 7) ☐ Claim(s) 12,21 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I (claims 10, 12-14, 16 and 17) in the reply filed on 7/28/2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Response to Preliminary Amendment

2. Preliminary Amendment filed on 7/28/2005 has been entered. In Pre-Amendment, claims 1-9, 11, 15, 18-20 have been cancelled. Claims 21 and 22 are newly added. Claims 10, 12-14, 16, 17, 21 and 22 are pending in the application.

Specification

3. The specification has been checked to the extent necessary to determine the present of all possible minor errors. However, Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

4. Claim 21 and 22 are objected to because of the following informalities: claim 21 depends on canceled claim 1. Appropriate correction is required.

For the purpose of examination, assumed that claim 21 depends on claim 10.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 10, 13, 14, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukamoto., (US Pat No. 5,640,052) in view of Tilly., (US Pat No. 6,297,562).

Regarding claim 10, Tsukamoto teaches a circuit board assembly comprising:
a substrate 2 comprising a substrate pad 6 (col. 3, lines 5-15 and Fig. 1);
a chip 1, comprising a terminal with a planar base 5 aligned with the pad 6 (col. 3, lines 5-15 and Fig. 1). *Note that the chip is considered a component.*

the terminal 5 including a elongated member 4, having an outer surface and a cross section area extending from the terminal base 5 (col. 3, lines 20-26 and Fig. 1).
Note that the core member 4 is considered the elongated member; and

a solder 3 deposit having a hourglass shape, covering the pad 6 and the outer surface of the elongated member 4 (col. 3, lines 20-26 and Fig. 1).

Tsukamoto teaches the substrate 2 and the chip (or component) 1, but does not teach the substrate is a circuit board, and the chip is a component package.

However, Tilly teaches the substrate 32 is a circuit board (col. 4, line 18 and Fig. 3), and the chip 20 is a component package (col. 3, lines 24-26, lines 57-65 and Fig. 3). Since Tsukamoto and Tilly are all from the same field of endeavor, the purpose disclosed by Tilly would have been recognized in the pertinent art of Tsukamoto. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to provide the component package on the circuit board in order to improve the density of the device package as taught by Tilly, column 5, lines 60-65.

Regarding claim 13, Tsukamoto teaches wherein the pad 6 has a surface area greater than the cross section area of the elongated member 4 (col. 3, lines 13-15, lines 50-56, Figs. 2a-2c).

Regarding claim 14, Tsukamoto teaches wherein the elongated member 4 has a conic shape (col. 5, line 60 and Fig. 6b).

Regarding claim 21, Tsukamoto teaches the solder deposit 3 has a length L_6 is approximately the length ($L_2 + L_3$) of the elongated member 4 (col. 3, lines 30-65, Figs. 2a-2b).

Regarding claim 22, Tsukamoto teaches the cross section of the solder deposit 3 along its length L_5 is smaller than the planar base area of the terminal 5 (col. 3, lines 1-5, lines 40-45 and Fig. 2b).

7. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukamoto (US Pat No. 5,640,052) and Tilly (US Pat No. 6,297,562) as applied to claim 10 above, and further in view of Inatsugu (US Pat No. 6,821,820).

Regarding claim 16, Tilly teaches the component or chip package 20 (col. 3, lines 24-26, lines 57-65 and Fig. 3), but does not teach wherein the component package comprises a Quad Flat No-lead (QFN) package.

However, Inatsugu teaches wherein the component package comprises a Quad Flat No-lead (QFN) package (col. 11 lines 48-60). Since Tilly and Inatsugu are all from the same field of endeavor, the purpose disclosed by Inatsugu would have been recognized in the pertinent art of Tilly. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to provide the component

package comprises a Quad Flat No-lead (QFN) package so that the anchor effect can be achieved and thus the coming off of the lead portion from the molding resin can be presented in as taught by Inatsugu, column 11, lines 55-60.

Regarding claim 17, Tilly teaches the component or chip package 20 (col. 3, lines 24-26, lines 57-65 and Fig. 3), but does not teach wherein the component package comprises a Small Outline No-lead (SON) package.

However, Inatsugu teaches wherein the component package comprises a Small Outline No-lead (SON) package (col. 11 lines 48-60). Since Tilly and Inatsugu are all from the same field of endeavor, the purpose disclosed by Inatsugu would have been recognized in the pertinent art of Tilly. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to provide the component package comprises a Small Outline No-lead (SON) package so that the anchor effect can be achieved and thus the coming off of the lead portion from the molding resin can be presented in as taught by Inatsugu, column 11, lines 55-60.

Allowable Subject Matter

8. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: None of the references of record teaches or suggest the claim circuit board assembly wherein the elongated member has a J-hook shape as claimed in dependent claim 12.


Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quoc Hoang whose telephone number is (571) 272-1780. The examiner can normally be reached on Monday-Friday from 8.00 AM to 5.00 PM.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone numbers of the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Quoc Hoang
Patent examiner/AU 2818


02/23/2016